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EXAMINER	
CALANDRA, ANTHONY J	
ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary	Application No.	Applicant(s)	
	10/564,881	JAWAID, ABRAR	
	Examiner	Art Unit	
	ANTHONY J. CALANDRA	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-42,44 and 45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-42, 44 and 45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Office Action

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/12/2008 has been entered.

2. Claims 1-22 and 43 are cancelled. Claims 44 and 45 are newly submitted. Claims 23, 41, and 42 have been amended. Claims 23-42, 44, and 45 are currently pending.

Claim Notes

3. Applicant amended instant claims 23, 41, and 42 to recite the limitation composite board in the preamble. However, the applicant only recites the limitation in the body of the claim in instant claim 1; this should be corrected for claims 41 and 42.

Additionally as discussed in the 2/18/09 interview as radio waves and other electromagnetic waves currently propagate through the atmosphere; one literal interpretation of the instant independent claims would be just soaking the composite board since some (albeit very weak) waves will pass through the system. To overcome this, the applicant should state that the electromagnetic radiation is generated. The examiner suggests this following claim format below. Applicant has support for generating EM radiation because of the magnetron disclosed in the specification [pg. 5 lines 13-20].

Claim 23. (Currently amended) A method of recovering a lignocellulosic element from a composite board material comprised of a matrix of adhesively bonded lignocellulosic elements, the method comprising

(a)Generating electromagnetic radiation

(b) swelling the composite board material by subjecting the material to a combination of (i) said generated electromagnetic radiation and (ii) soaking or immersion in a liquid medium, wherein the electromagnetic radiation has a frequency in the range of from 896 + 20 MHz to 2450 + 25 MHz or a frequency in the range of from 100 kHz to 100 MHz, and

(c) recovering the lignocellulosic element.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 23, 24, 27-39, 41, 42, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,804,035 MICHANICKL et al., hereinafter MICHANICKL et al. in view of WIPO publication WO 03/040462 AKHTAR et al., hereinafter AKHTAR et al, and, if necessary, JP 58219005A, hereinafter JP005, or, if necessary, U.S. Patent 3,092,536 RUSSELL, hereinafter RUSSELL.

As for claim 23, MICHANICKL et al. discloses a method where a board material that is composed of adhesively bonded components has a constituent of it recovered (*A method of recovering a constituent of a composite board material comprised of a matrix of adhesively bonded lignocellulosic elements* [see e.g. abstract]). MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium* [see e.g. Figure 1 and column 6 lines 25-30]). MICHANICKL et al. teaches that the recovered chips and fibers can be recovered and reused to make new fiberboard (*recovering the constituent* [see e.g. column 7 lines 30-35]).

MICHANICKL et al. further discloses that full disintegration requires an impregnation of at least 80% treatment chemical and that the impregnation speed can be increased by vacuum treatment, pressure treatment, or heating the impregnation solution [see e.g. column 5 lines 8-17]. MICHANICKL et al. however does not disclose using electromagnetic radiation to help with disintegration or increase the impregnation rate. AKHTAR et al. teaches a process for treating wood logs which are going to be pulped mechanically or chemi-mechanically [see e.g. abstract and paragraph 0040]. In AKHTAR, the logs are first exposed to a electromagnetic radiation, microwaves, at 915 MHz, (*electromagnetic radiation and wherein the electromagnetic radiation has a frequency in the range of from 896 + 20 MHz to 2450 + 25 MHz or a frequency in the range of from 100 kHz to 100 MHz* [see e.g. paragraph 0054 and 0055]) and then treated in a further pulping process. At the time of the invention it would have been obvious to pre-treat the board material of MICHANICKL et al. with the microwave radiation of AKHTAR et al. A person of ordinary skill in the art would have been motivated to do so since microwave radiation increases the porosity and permeability of fibers by breaking pit membranes and vessel ends [see

e.g. AKHTAR paragraph 0038]. This increase in permeability leads lower chemical uses [see e.g. AKHTAR paragraph 0038]. Similarly, the fibers and chips in the board material would also increase in permeability and porosity allowing higher impregnation and impregnation rate as desired by MICHANICKL et al.

Additionally, a person of ordinary skill in the art would be expect that microwave/radio wave pretreatment would increase impregnation of a composite board material by both JP005 and RUSSELL. In RUSSELL it is disclosed that it is disclosed that radio waves can increase the depth of and speed of impregnation [column 3 lines 3-8]. RUSSELL further discloses "*that the process may be applied in the case of almost any material to* ***almost any solid dielectric material*** *in which it is desirable to penetrate the liquid* [column 3 lines 28-30]". RUSSELL while not disclosing composite board discloses glass fibers, asbestos [30-32] which are two materials that are far more different from wood then a composite wood material. JP005 also describes dielectric/induction heating facilitates impregnation and shortens impregnation time [Derwent summary paragraph 1]. JP005 discloses multiple materials including wood and composite wood material such as plywood (thin layers of wood glued together to form a board material) [Derwent summary paragraph 2].

Therefore at the time of the invention a person of ordinary skill in the art would be further motivated to apply the known technology of dielectric heating (microwave/radio wave) of AKHTAR to the composite material of MICHANICKL to increase impregnation. A person of ordinary skill in the art would expect dielectric heating to work on dielectric material including composite wood based materials as suggested by both RUSSEL and 'JP005.

The examiner would finally like to point out the KSR decision in which known work in one field of endeavor may prompt variations of it for use in either the same field or a different based on design incentives, if the variations are predictable to one of ordinary skill in the art. In the instant case microwave pretreatment improves impregnation which is a design incentive. A person of ordinary skill in the art would expect success for applying microwaving to composite boards by JP005 and RUSSELL who disclose that microwaving improves impregnation for a wide range of materials.

As for claim 24, AKHTAR et al. teaches the use of microwave radiation and uses a generator that generates 915 MHz microwave radiation which falls within the instant claimed range [see e.g. paragraph 0054].

As for claim 27, AKHTAR et al. discloses multiple power ranges for the microwave radiation treatment including 10 kW and 20 kW which fall within the instant claimed ranges [see e.g. Figure 7].

As for claim 28 and 29, MICHANICKL et al. discloses that the impregnating solution consists of water, urea, and lye [see e.g. column 7 lines 1-5 and column 6 lines 25-30]. Water is a polar solvent.

As for claim 30, AKHTAR et al. discloses that the microwave pretreatment occurs before impregnation as this allows for increased porosity for chemical treatment before refining [see e.g. paragraphs 0038- 0040].

As for claim 31 and 32, MICHANICKL et al. discloses that the impregnation treatment takes place at the elevated temperature of 80-120 degrees Celsius, which overlaps with the instant claimed range [see e.g. column 3 lines 1-6].

As for claim 33, AKHTAR et al. discloses that the electromagnetic microwave pretreatment occurs before impregnation [see e.g. paragraphs 0038- 0040] and does not disclose having the microwave pretreatment and impregnation occur simultaneously. MICHANICKL et al. discloses that the impregnation can be sped up by heating of the impregnation solution. Examiner notes that microwaving will in addition to opening the pores of the fibers, would also additionally heat the impregnation solution. Therefore, it would be *prima facie* obvious to submerse and expose the board material to microwave radiation simultaneously.

As for claim 34, MICHANICKL et al. discloses that impregnation vessel contains a stirring device [see e.g. column 9 line 21]. Examiner has interpreted the stirring device as a mechanical agitator which breaks the fiber board into a solution of chips, fibers, veneer, and other undesired components [see e.g. column 9 lines 45-48].

As for claim 35 and 36, MICHANICKL et al. disclose that the chips and fibers are removed and transferred to a reprocessing plant. Chips and fines are lignocelluloses. Further MICHANICKL et al. disclose that the recovered chips and fibers can be reprocessed into chip board or fiber board, both processes of which require drying [see e.g. column 7 lines 30-35].

As for claims 37 and 38, MICHANICKL et al. discloses that the process may be used on medium density fiber boards [see e.g. column 5 lines 44-47].

As for claim 39, AKHTAR et al. discloses that the electromagnetic radiation used is microwave radiation [see e.g. abstract].

As for claim 41 and 42, MICHANICKL et al. and AKHTAR disclose the features as per claim 23 above. MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor at the overlapping temperature of 80 to 120 degrees C (*swelling the material by subjecting*

the material to a soaking or immersion in a liquid medium at a temperature of 60 C to 90 C [see e.g. Figure 1 and column 6 lines 25-30 and column 3 lines 3-6]).

AKHTAR discloses that the microwave radiation treatment can last from a 90 seconds to 6 minutes and does not disclose the instant claimed range of 30 to 90 seconds [see e.g. Figure 7]. However, at the time of the invention it would have been obvious to a person of ordinary skill in the art to optimize the amount of time that the board material was exposed microwaves to depending on the total mass of the board, moisture content, board temperature, and how easily the board is breaking up in further treatments in order to adjust the total energy exposure [see e.g. MPEP 2144.05 II B]. The time of the microwaving is a result effective variable which determines how much heat is absorbed by the board.

Neither, MICHANICKL et al. nor AKHTAR gives any direct guidance to the time between microwave treatment and impregnation. However, a short time between microwaving and soaking would be expected as there are no disclosed intervening steps between the microwave and impregnation step. Further, MICHANICKL discloses that heating is important [see e.g. column 5 lines 10-17] and letting the board sit after microwaving would waste heat. Therefore sending the microwave treated board within 5 to 15 seconds to the immersion bath would have been obvious to a person of ordinary skill in the art.

RUSSELL and JP005 further support the rejection as per above in instant claim 23.

As for claim 44, MICHANICKL discloses medium density fiberboard and chip board [column 5 line 45].

As for claim 45, MICHANICKL discloses a urea-formaldehyde binder [abstract].

5. Claims 25, 26 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,804,035 MICHANICKL et al., hereinafter MICHANICKL et al. in view of WIPO publication WO 03/040462 AKHTAR et al., hereinafter AKHTAR et al. and if necessary, JP 58219005A, hereinafter JP005, or, if necessary, U.S. Patent 3,092,536 RUSSELL, hereinafter RUSSELL, as applied to claims 23, 24, 27-39, 41, 42, 44, and 45 above, and further in view of U.S. Patent 4,000,032 BERSTROM et al, hereinafter BERSTROM et al.

As for claim 25, AKHTAR disclose that microwave radiation can be used as a pre-treatment for lignocellulosic fibers. AKHTAR only discloses the single frequency of 915 MHz [see e.g. paragraph 0054] and does not disclose the frequency of 2450 MHz. BERGSTROM et al. discloses the specific frequency of 2450 MHz [see e.g. column 5 line 52]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute the 2450 MHz wave of BERGSTROM et al. for the 915 MHz wave of MICHANICKL et al. and AKHTAR et al. A person of ordinary skill in the art would reasonably expect that both frequency waves to heat up the board material and open up the pores of the fibers to allow greater impregnation. Examiner further notes as stated in the specification that 915 and 2450 MHz are both the reserved frequencies for industrial/domestic use [see e.g. pg. 5] and it would have been obvious to try one of a finite number of available industrial microwave types.

As for claim 26 and 40, neither MICHANICKL et al. nor AKHTAR et al. disclose using radio waves to pre-treat lignocellulosic materials before impregnation. BERGSTROM et al. discloses that a wide range of frequencies can be used to irradiate lignocellulosic materials from 10 MHz to 300,000 MHz [see e.g. column 3 lines 53-55]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute radio waves of

BERGSTROM et al. for the microwave pretreatment of MICHANICKL et al. and AKHTAR et al. A person of ordinary skill in the art would reasonably expect that both radio waves would heat up and increase the permeability of the board materials of MICHANICKL et al. in similar fashion as the microwaves of AKHTAR et al.

6. Claims 23-25, 28, 29, and 31-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,804,035 MICHANICKL et al., hereinafter MICHANICKL et al. in view of U.S. Patent 6,537, 341 DANNENHAUER et al., hereinafter DANNENHAUER.

As for claim 23, MICHANICKL et al. discloses a method where a board material that is composed of adhesively bonded components has a constituent of it recovered (*A method of recovering a constituent of a composite board material comprised of a matrix of adhesively bonded lignocellulosic elements* [see e.g. abstract]). MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium* [see e.g. Figure 1 and column 6 lines 25-30]). MICHANICKL et al. teaches that the recovered chips and fibers can be recovered and reused to make new fiberboard (*recovering the constituent* [see e.g. column 7 lines 30-35]). MICHANICKL et al. further discloses that full disintegration requires an impregnation of at least 80% treatment chemical and that the impregnation speed can be increased by vacuum treatment, pressure treatment, or heating the impregnation solution [see e.g. column 5 lines 8-17]. MICHANICKL et al. does not disclose any radiation treatment. DANNENHAUER discloses that radiation treatment with a solvent can be used to break up composite materials with natural fibers glued together [abstract, column 2 lines 55-60]. DANNENHAUER discloses the

frequency band of 2000 – 3000 MHz which overlaps with the instant claimed range. [column 2 lines 4-10].

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the microwave technology of DANNENHAUER to the board recycling process of MICHANICKL et al. a person of ordinary skill in the art would be motivated to do so to break up the polymer chains and assist the solvent in dissolving the matrix which binds the fibers togther [column 1 lines 55-65]. A person of ordinary skill in the art would expect the process to work on composite fiberboards as the process works on organic fibers bound by polymer matrices [column 2 lines 55-65].

As for claims 24 and 25, DANNENHAUER discloses that currently available industrial microwaves can be used and discloses the frequency band of 2000 – 3000 MHz [column 2 lines 4-10]. The frequency of 2450 falls between the disclosed frequency band. Further both frequencies of 896 and 2450 are known industrial microwave frequencies.

As for claim 28 and 29, MICHANICKL et al. discloses that the impregnating solution consists of water, urea, and lye [see e.g. column 7 lines 1-5 and column 6 lines 25-30]. Water is a polar solvent. DANNENHAUER also discloses organic solvents an water as a solvent [column 2 lines 10-27]

As for claim 31 and 32, MICHANICKL et al. discloses that the impregnation treatment takes place at the elevated temperature of 80-120 degrees Celsius, which overlaps with the instant claimed range [see e.g. column 3 lines 1-6].

As for claim 33, DANNENHAUER discloses treating the composite material in the solvent with the microwave simultaneously [column 3 lines 20-25]

As for claim 34, MICHANICKL et al. discloses that impregnation vessel contains a stirring device [see e.g. column 9 line 21]. Examiner has interpreted the stirring device as a mechanical agitator which breaks the fiber board into a solution of chips, fibers, veneer, and other undesired components [see e.g. column 9 lines 45-48].

As for claim 35 and 36, MICHANICKL et al. disclose that the chips and fibers are removed and transferred to a reprocessing plant. Chips and fines are lignocelluloses. Further MICHANICKL et al. disclose that the recovered chips and fibers can be reprocessed into chip board or fiber board, both processes of which require drying [see e.g. column 7 lines 30-35].

As for claims 37 and 38, MICHANICKL et al. discloses that the process may be used on medium density fiber boards [see e.g. column 5 lines 44-47].

As for claim 39, DANNENHAUER et al. discloses that the electromagnetic radiation used is microwave radiation [see e.g. column 2 lines 4-10].

As for claim 40, DANNENHAUER discloses 300 MHz to 300 Ghz which overlaps with RF frequency [column 2 lines 4-10].

As for claim 27 and 41, MICHANICKL et al. and DANNENHAUER disclose the features as per above. MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor at the overlapping temperature of 80 to 120 degrees C (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium at a temperature of 60 C to 90 C* [see e.g. Figure 1 and column 6 lines 25-30 and column 3 lines 3-6]).

DANNENHAUER gives a power level of 500 Watts [figure 3]. Further it would be obvious to a person of ordinary skill in the art to optimize the power level of the microwave

depending on the weight or volume of board treated. A larger amount of wood requires more power.

As for claim 44, MICHANICKL discloses medium density fiberboard and chip board [column 5 line 45].

As for claim 45, MICHANICKL discloses a urea-formaldehyde binder [abstract].

Response to Amendment

7. The declaration under 37 CFR 1.132 filed 12/12/2008, by JAWAID, is insufficient to overcome the rejection of claim 23-42 and 44-45 based upon MICHANICKL and AKHTAR as set forth in the last Office action because:

JAWAID discloses the structure of wood (paragraph 5) and the nature of lignin (paragraph 6). Applicant argues that the term glue in GULLICHSEN is used figuratively (paragraph 8) and that a board material has a specific meaning of a composite material of wood chips, fragments, or particles of wood which have been bonded together artificially using a man-made glue and a person of ordinary skill in the art would not consider lignin a adhesive (paragraph 9). Applicant argues that board materials are highly homogenous and do not retain the complexity of wood structure (paragraph 11). JAWAID states that regardless the claims have been modified to state that the board is a composite board (paragraph 12).

The examiner agrees that the amendment of '*composite*' board limits the board to be treated of a board which contains wood lignocellulosic elements and man-made glue. The

examiner agrees in part with the applicant's statement that composite board materials are highly homogenous in comparison to wood. The examiner agrees with this statement for fiber and particle boards. However for chip board derived from smaller chips, the chips would retain the original complexity of wood. In the case of recovering a lignocellulosic member these chips must also be broken down into their individual fibers much like AKHTAR.

In the case of medium density fiber board, MICHANICKL teaches composite boards such as MDF bound by mad made urea-formaldehyde. If chipboard is excluded from the claims, the main question in dispute between the applicant and the examiner is as follows 'Would it be obvious to apply a known technique of microwaving used on natural whole wood to a homogeneous composite wood structure?".

In the 12/12/2008 declaration by JAWAID answered this primary question in the negative. JAWAID states wood contains a highly organized structure in which steam pressure is generated within the wood and it is this structure which supports the conduction of water (impregnation process) throughout the wood. In contrast in the JAWAID expert opinion the lack an intact network of vessels and pit membrane connections would prevent the buildup of steam and subsequent impregnation into the material.

The examiner agrees for MDF, particle, and fiberboards that the network structure is not intact. However, for chipboards there would be substantial network structure intact in individual wood chips. In the case of MDF fiberboard, and particle boards while there would not be an intact network the vessels would still exist. Impregnation includes surrounding the vessels and

hydrating inside the vessels. It would be expected that there would be some improvement of the impregnation inside of individual vessel elements. It is the examiner's position that a composite wood material and natural wood material are similar enough that microwaves would work on both homogenous composite materials comprised of wood fibers and whole wood. In the instant rejection the examiner adds further support for this rejection in view of JP005 and RUSSELL.

In RUSSELL it is disclosed that it is disclosed that radio waves can increase the depth of and speed of impregnation [column 3 lines 3-8]. RUSSELL further discloses "*that the process may be applied in the case of almost any material to almost any solid dielectric material in which it is desirable to penetrate the liquid* [column 3 lines 28-30]". RUSSELL while not disclosing composite board discloses glass fibers, asbestos [30-32] which are two materials that are far more different from wood then a composite wood material. JP005 also describes dielectric/induction heating facilitates impregnation and shortens impregnation time [Derwent summary paragraph 1]. JP005 discloses multiple materials including wood and composite wood material such as plywood (thin layers of wood glued together to form a board material) [Derwent summary paragraph 2].

The final declaratory argument is that AKHTAR is to minimizing the amount of lignin in the material while the instant claimed method is to preserve the material.

AKHTAR discloses mechanical pulping. In mechanical pulping a majority of the lignin is retained. This is in contrast to chemical pulping in which lignin is removed. In any case AKHTAR is used to provide the advantage of microwaving to increase impregnation.

Response to Arguments

8. Applicant's arguments filed 12/12/2008 have been fully considered but they are not persuasive.

Applicant remarks on the definition of composite.

The examiner agrees that composite in the application is a material comprised of wood and manmade bonding elements (man-made glue such as urea-formaldehyde) as per the declaration above. The applicant has clear support for the term composite.

As per above in the declaration the applicant agrees that the primary question is 'Would it be obvious to apply a known technique of microwaving used on natural whole wood to a homogeneous composite wood structure?". The applicant argues the case based on three positions, AKHTAR is non-analogous art, even if the art is analogous the starting material between AKHTAR and the instant material is so different as to not combine, and finally the function and purpose of microwave operation are such that it would not be obvious to apply AKHTARS teachings.

Applicant states that the instant claims are to recycling board materials while AKHTAR is to reducing lignocellulose into its distinct components of lignin and cellulose and can be used to

make a paper which has a low amount of lignin. Applicant points out paragraph 0003 which states 'separate lignin from the matrix of wood fibers'. Applicant states that the starting materials and end products are different and the use of the end products is different. Applicant argues that the fields of natural wood and recycling discarded furniture are different fields of endeavor.

AKHTAR does not remove lignin to a large extent as it is a mechanical process. Mechanical pulps retain a large amount of lignin within the fibers. AKHTAR is to breaking the lignin which holds the fibers together. If AKHTAR was a chemical process such as kraft delignification then the applicant could reasonably argue that the end products where different. However, in this case a majority of lignin is retained as it is a mechanical pulping process [column 3 lines 25-37]. The examiner notes that the breakdown of the composite boards is also a mechanical process.

The instant claims, AKHTAR and MICHANICKL are all related to the art field of recovery of fibrous material by mechanical processes. In all three cases fibrous material is recovered.

Applicant argues that an art is only analogous if it is reasonably pertinent to the particular problem concerned.

The art is analogous as per above. Additionally, even if not analogous it is reasonably pertinent as it teaches that microwaves increase impregnation. Impregnation increase is particularly pertinent to soaking of composite board materials to recover lignocellulosic fibers.

Applicant argues that as per the inventors declaration there are differences between logs and wood planks and composite board material, i.e. the starting material is different.

Please see *response to amendment* above. In summary the examiner agrees that the starting material is different, except in the case of chip boards which contain chips which retain substantially similar characteristics of wood. However, even though composite materials (with the exclusion of chip board) are different then wood, in view of JP005 and RUSSELL it is known that microwaving improves a multitude of dielectric materials including composite boards such as plywood. This microwaving improves both impregnation amount and speed in dielectric materials. An improvement in impregnation and speed is a clear motivation to combined AKHTAR and MICHANICKL and is supported by JP005 and RUSSELL.

Applicant argues that the purpose and function for combination of AKHTRAR with MICHANICKL is different.

In response to applicant's argument that there is a different reason to combine, the fact that applicant has recognized another advantage which would flow naturally from following the

suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In the instant case microwave radiation improves impregnation. This is supported by JP005 and RUSSELL.

Applicant argues that the wood is separated into individual components of lignin in cellulose. Applicant relies on paragraph 0003 of AKHTAR to support this argument and an article in biomass magazine.

Again the examiner notes that AKHTAR is a mechanical process which maintains a majority of the lignin [column 3 lines 25-37]. While AKHTAR separates individual fibers from a lignin matrix the lignin is still retained in the individual fiber walls. A mechanical process maintains a large amount of lignin, this is in contrast to a chemical process which removes a large quantity of the lignin (for bleached pulps all of the lignin is removed). This is supported by AKHTAR in column 11 which contrasts mechanical pulp with high lignin content to low lignin content of chemical pulp.

Applicant argues that composite board lacks the internal structure necessary to support the benefits of pre microwave treatment for impregnation.

The examiner agrees that composite boards, excluding chip boards, lack the same structure as wood. However, in view of JP005 and RUSSELL it is clear that dielectric/induction pretreatment by radio waves/microwaves improves impregnation and impregnation speed for a wide range of materials including composite boards such as plywood and materials that are clearly different from wood including glass and asbestos fibers.

As such the examiner believes that it has been shown that AKHTAR is analogues art field of recovery of fibrous material by mechanical processes. That while the starting material is different (except for chip board which comprises chips with substantially the same structures as wood), microwave pretreatment is shown to increase impregnation in a wide range of materials. Finally, the reason for combination does not have to be the same as the applicant's reason for combination. Increasing impregnation and impregnation speed is a clear motivation to combine.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/AJC/

/Eric Hug/
Primary Examiner, Art Unit 1791